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ON THE PREPARATION OF GLYCERIN SUPPOSITORIES.

By Professor Joseph P. Remington, Ph.M.

From the Proceedings of the American Pharmaceutical Association, July 16.

Glycerin suppositories are now very largely manufactured and, as is well known, they are used for producing a gentle laxative effect upon the bowels. The problem which has confronted the pharmacist has been to combine a comparatively large quantity of glycerin with an inert body, capable of giving the requisite solidity to the mass, and at the same time be soft enough to liquefy in the rectum. Very many formulas have been in existence, but in the writer's opinion, none give as much satisfaction as the following:

GLYCERIN SUPPOSITORIES.

Sodium carbonate,	40 gr.
Stearic acid,	80 "
Glycerin,	1,080 "

Dissolve the sodium carbonate in the glycerin, add the stearic acid, heat carefully (preferably by the use of a water-bath) until effervescence ceases; the solution is then poured into a suppository mould to make twelve suppositories. There is no necessity for cooling the moulds with ice, although there is no objection to this in warm weather. As each suppository contains about ninety per cent. of glycerin, they must be protected from the action of moist air, which has a tendency to liquefy them. Several expedients are resorted to. Each one may be wrapped in tin-foil, or quickly dipped in melted paraffin; or each one enclosed in a small glass vial without a shoulder and made for the purpose of holding one suppository.

ON FLUID EXTRACTS OF ERYTHROXYLON AND CINCHONA.

By Professor Joseph P. Remington, Ph.M.

From the Proceedings of the American Pharmaceutical Association, July 16.

During the past winter the writer has been engaged in examining practically the various menstrua for the official fluid extracts and the results of these labors may be summarized as follows: The menstruum for Fluid Extract of Erythroxylon in the present Pharmacopœia contains more alcohol than is necessary; the best results were obtained from menstrua made by mixing one part of alcohol with two parts of water, both by volume. This made a fluid extract in which the very slight precipitate was found to be of inert matter.

In the case of the Fluid Extract of Cinchona, the menstruum which yields the best results was one which was composed of four parts of alcohol and one of glycerin, both by volume, finishing the percolation with a mixture of four parts alcohol and one of water, both by volume.

This menstruum yields a fluid extract, which though exposed for six months to a lower temperature than that prevailing at the time of its percolation, has not produced any precipitate whatever.

ANDROMEDA MARIANA.

By Andrew W. Dowd, Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy. No. 114.

This shrub is commonly called "stagger bush." It belongs to the natural order of Ericaceæ and grows in low, sandy places, throughout New Jersey and southward near the coast. The leaves are said to be poisonous to lambs and calves.

A proximate analysis of the leaves yielded the following results:

	Per Cent.	
Moisture,		2·16
Ash,		5·25
Extracted by petroleum ether:		
Volatile oil,	·034	2·58
Fat,	0·320	
Wax and caoutchouc,	2·226	
" Stronger ether,		3·82
" Absolute alcohol,		18·70

	Per Cent.	Per Cent.
Extracted by Water:		
Mucilage,	1·35	12·28
Dextrin,	2·98	
Glucose,	3·83	
Undetermined,	4·12	
" Diluted alkali:		
Pectin and albuminoids,	2·73	8·55
Undetermined,	5·82	
" Acidulated water,		4·38
" Boiling water:		
Chiefly starch,		1·99
Lignin,		3·18
Incrusting matter,		5·86
Cellulose,		31·25
Total,		100·00

The ethereal extract consisted largely of chlorophyll and resin.

The alcoholic extract contained red coloring matter, tannin and resin. It also contained a sweet principle of a glucosidal character. This was probably the *andromedotoxin* so prevalent in the poisonous plants belonging to this natural order. A larger quantity was prepared by extracting another portion of the leaves with ninety-five per cent. alcohol, concentrating, and pouring the solution into acidulated water. After filtering, the clear filtrate was agitated with ether which removed the sweet principle, and yielded it as an amorphous mass on the evaporation of the ether. Attempts were made to purify this compound, and obtain it in a crystalline condition by dissolving in water and again agitating with ether, but decomposition occurred to such an extent as to render the result of too small an amount to be of value. The sweet taste likewise disappeared with each purification.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

Mercurial soaps.—The direct saponification of fats and oils by mercuric oxide not being feasible because of the reduction of the oxide to metal, and the precipitation of mercuric chloride solution by soap solution yielding a product from which the excess of mercuric chloride can only be removed by repeatedly boiling with fresh portions of water during which separation of metallic mercury also occurs, Mr. C. Micko was compelled to first separate the fatty acids from

the fats and oils and then by warming cause these to react with yellow oxide of mercury; the products were entirely satisfactory for medicinal use. The fats were saponified in the usual manner and the fatty acids liberated from the alkali-soaps by adding hydrochloric acid; after boiling the fatty acids with several portions of water to remove mineral acid, they are transferred to a capsule and dried in an air-bath. To determine the necessary mercuric oxide about two grams of the acid are titrated with $\frac{n}{2}$ alkali, using phenolphthalein as indicator (for most purposes the oxide necessary can be calculated if the average molecular weight of the fatty acids is known, this requiring 108 parts mercuric oxide). The acids and oxide are rubbed together; then a little water added and heated carefully on a water-bath until the color of the oxide disappears (if the acids separated from tallow be used the operation must be completed by finally heating carefully on an oil-bath); to obtain good results excessive heating must be avoided. The following table gives (1) the source, (2) saponification-equivalent, (3) average molecular weight, and (4) iodine absorption of the fatty acids; (5) percentage of HgO, (6) color, and (7) consistence of the resulting soaps.

1	2	3	4	5	6	7
Sesame oil, . . .	198·0	283·3	110·5	28·26	yellowish	of cold cream
Olive oil, ...	200·3	280·1	88·5	28·48	yellow	"
Lard, ...	202·0	277·8	65·0	28·69	almost white	firmer
Palm oil, ...	207·0	271·0	53·4	29·18	orange to brown	"
Beef suet, ...	200·0	280·5	38·5	28·45	almost white	of lead plaster
Cocoanut oil, . .	276·3	205·3	8·6	35·70	"	waxy
Stearic acid, . . .	205·7	272·7	1·7	29·05	"	friable

The consistency of the soaps, also their susceptibility to decomposition by heat, follow the variation in the iodine-absorption of the fatty acids; while the soap made from sesame oil-acids is soft so that it can be drawn into threads, it is most easily decomposed by heat; commercial stearic acid yields a soap so hard that it can be powdered and used in this condition. These soaps are much more permanent than the commercial oleates (solution of true oleate in excess of oleic acid); for the preparation of pastes and ointments the soap made from olive oil is most desirable, while for plasters the soaps from beef suet or cocoanut oil, owing to their firmer con-

sistency, are to be preferred. For these purposes it is only necessary to soften the soaps on a water-bath and then incorporate the other ingredients.—*Oesterr. Ztschr. f. Pharm.*, 1892, 354 and 372.

Ferrum reductum.—An examination of commercial samples failing to find a single specimen meeting the requirements of the Pharm. Austr. (98 8 per cent. Fe) caused an inquiry to be made regarding the difficulty. It was found that if the hydrogen, generated from zinc and sulphuric acid, was not purified before acting upon the heated ferric oxide, three hours' exposure produced a preparation of grayish black color which dissolved in dilute sulphuric acid only after prolonged boiling, and was found to contain only 58 per cent. Fe. By purifying the hydrogen, passing it successively through concentrated permanganate of potassium solution, lead acetate solution, sulphuric acid, and finally over fused calcium chloride, three hours' exposure sufficed to reduce the ferric oxide and there was obtained a dark gray powder, readily and completely soluble in dilute sulphuric acid without heat and containing 99·68 per cent. Fe. It appears, therefore, that a satisfactory product necessitates the use of purified hydrogen.—T. Appel, *Oesterr. Ztschr. f. Pharm.*, 1892, 395.

Cantharidin and cantharidal cerate.—The manufacture of cantharidin by the following improved process has given good results during the past eleven years; by it the free and combined cantharidin is extracted; 1000·0 moderately-fine powdered cantharides are macerated in the cold for two days with a mixture of 20·0 sulphuric acid (sp. gr. 1·838) and 1500·0 acetic ether (sp. gr. 0·902); after adding 40·0 barium carbonate the mixture is exhausted with acetic ether in an extraction apparatus. The solvent is distilled off, and the residue consisting of resin, fat and cantharidin is allowed to stand eight days to induce crystallization of the cantharidin; 200·0 petroleum-ether (sp. gr. 0·740) are then added and gentle heat is applied to facilitate solution of the fat; the solution is filtered off, the cantharidin washed with petroleum-ether and recrystallized from 90 per cent. alcohol. The product is almost white and sufficiently pure for the manufacture of plasters, etc.; should the cantharidin be needed purer for other purposes, it must be recrystallized from acetic ether with the addition of animal charcoal. The following yields have been obtained: Lytta vesicatoria, 0·3–0·45 per cent.; Epicauta Gorrhami (a Japanese beetle), 0·45 per cent., Mylabris Cichorii, 0·9–1·3 per cent.

The several pharmacopœias in their formulas for making the *cantharidal cerate* extract *only* the *free* cantharidin; in the following process it is aimed to extract the *total* cantharidin; 100·0 olive oil and 525·0 yellow wax are melted and a mixture of 1·0 sulphuric acid (sp. gr. 1·838) and 10·0 alcohol (90 per cent.) uniformly mixed in; after adding 250·0 finely-powdered cantharides, the mass is allowed to stand for two hours at 60–70° C., stirring frequently; finally, an intimate mixture 2·0 barium carbonate and 60 alcohol (90 per cent.) is incorporated. The process has already suggested the question, "Would it not be better to add the acid mixture to the cantharides and later to add the oil and wax?"—*Pharm. Centralhalle*, 1892, 425.

Test for Cocaine.—To a small quantity of the alkaloid add 1 cc. nitric acid (sp. gr. 1·4) and evaporate to dryness on a water-bath; to the cold residue add one drop of an alcoholic potash solution (amyl instead of ethyl alcohol gives a better reaction), no change is noticed until the test is warmed again on the water-bath, when an intense violet coloration will suddenly appear. The test differs from the one obtainable with atropine, inasmuch as the violet coloration here appears in the cold and is destroyed by subsequent heating on the water-bath.—A. Kuborne, *Pharm. Centralhalle*, 1892, 411 and 432.

In the manufacture of Salicylic Acid the distillation of the crude acid with superheated steam is attended by considerable loss. Dr. P. W. Hofmann has patented a process by which the distillation becomes unnecessary. To the crude lye is added some stannous chloride solution; this precipitates a dark oily mass, containing the objectionable impurities, while the supernatant liquid is as clear as water; the addition of hydrochloric acid then causes the precipitation of pure salicylic acid, which is freed from hydrochloric acid by washing and the use of centrifugals.—*Pharm. Centralhalle*, 1892, 412.

Creasote pills.—The dispensing of these pills has caused some difficulty on account of a suitable excipient and the volatility of the remedy. The following method of procedure is pronounced very satisfactory; it depends upon making first what is called a "creasote emulsion" (50 per cent.) from gelatin 5·50, distilled water 12·00, sugar 2·50 and creasote 20·00; the emulsion is preserved in tight-fitting glass-stoppered bottles. In making pills,

the corresponding quantity of the emulsion is taken and made into a mass by the addition of a little powdered liquorice and althæa. The emulsion should be taken from the bottle with a horn spatula since iron discolors it; the pill mass, however, can be removed from the mortar with an iron spatula.—J. Norberto, Jr., *Pharm. Post*, 1892, 817.

Test paper for sulphurous acid.—2 gm. wheat starch are made into a thin paste with 100 cc. boiling water and a solution of 0·2 gm. potassium iodate in 5 cc. water added; a good quality of filtering paper is impregnated with this solution, allowed to dry, cut into small strips and carefully preserved in glass-stoppered bottles. This paper when moistened will indicate very minute quantities of free sulphurous acid by the appearance of a blue color (the sulphurous acid liberates iodine from the iodate and this in turn reacts upon the starch, producing blue iodide of starch). Sulphites will also yield the blue color if the paper be first moistened with a diluted hydrochloric acid (1 : 100); the hydrochloric acid itself has no action upon the paper, being used to liberate small quantities of the sulphurous acid.—*Südd. Apotheker Ztg.*, 1892, 219.

Tooth ache drops.—(I) Oils of cajeput and cloves, each, 1·0; chloroform, 2·0. (II) Camphor and chloral hydrate each, 2·0; spirit of peppermint, 1·0. (III) Tincture of cannabis indica, oil of cloves and chloroform, each, 2·0. (IV) Tinct. opii crocat., olei menth. pip., spir. æther., āā 2·0.

Tooth soaps, hard.—Precipitated chalk, 8·0, carmine, 0·2, dissolved in water of ammonia, powdered soap, 20·0; peppermint oil, 0·5; alcohol, 3·0; after moulding it is to be dried. *Soft.*—Precipitated chalk, 20·0, carmine, 0·2 dissolved in water of ammonia, powdered soap, 5·0; peppermint oil, 0·5; syrup, glycerin, and alcohol of each sufficient. *Liquid.*—Soap liniment, 100·0, tincture of myrrh and glycerin, each, 20·0; oil of peppermint, 0·5; color to suit.

Tooth balsam.—Extract of opium, camphor and Peruvian balsam, each, 1·0; powdered mastich, 2·0; chloroform, 20·0; to be applied on cotton.

Tooth cement.—Pure zinc oxide, 98·0; magnesia, 2·0; glacial phosphoric acid, q. s.; the powders are to be mixed in a warm mortar, with sufficient melted acid to make a paste; it is to be used at once as it rapidly hardens.

Tooth wax.—Wax, 30·0; Venetian turpentine, 12·0; powdered mastich, 5·0; powdered opium, 3·0; chloral hydrate, 2·5.

Tooth wash.—Tannin, 5·0; tincture of iodine and tincture of myrrh, each, 2·5; potassium iodide, 1·0; rose water, 180·0; a teaspoonful in a glassful of warm water used as a wash will prevent decay and loosening of the teeth.

Antiseptic Tooth wash (Cordin).—Saccharin, 1·0; sodium bicarbonate, 0·5; alcohol, 100·0; oil of peppermint, gtt. xi.—*Apotheker Ztg.*, 1892, 347.

Oxychinaseptol (*diaphtherin*).—The properties published in Am. Journ. of Pharmacy, 1892, 374, are now supplemented as follows: Recrystallized from water it forms amber-yellow, transparent, hexagonal crystals, which powdered are soluble at least in an equal weight of water; melting point 85° C.; not decomposed until heated to 180–220° when phenol distils over; between 220° and 250° a mixture of oxychinoline and phenol distils, and between 250–269° C. oxychinoline with traces only of phenol passes over; the aqueous solution with ferric chloride occasions a blue green color destroyed by hydrochloric acid. Excess of sodium carbonate causes a separation of oxychinoline while phenol is found in solution. It is quite soluble in dilute alcohol, less so in strong alcohol.—*Pharm. Ztg.*, 1892, 429.

Lanolin milk.—20·0 powdered soap, 10·0 powdered borax, 70·0 water, 30·0 cocoanut oil, 70·0 hydrated lanolin are triturated together for at least 10 minutes and 800·0 warm rose-water (40° C.) gradually added; after agitation the preparation is perfumed with the oils of bergamot and orange flower, each, gtt. x; rose, gtt v, and wintergreen gtt. i.—E. Dieterich, *Pharm. Ztg.*, 1892, 429.

Thiosalicylic acid is recommended to be used medicinally for the same purposes as salicylic acid; patents have been applied for a process of preparing it from anthranilic acid by converting this into *o*-diazo-benzoic acid, treating with hydrogen sulphide, then with sodium carbonate or hydrate, and supersaturating with hydrochloric or sulphuric acid. On oxidation it gives at once *ortho-sulphobenzoic* acid free from isomers and, therefore, important in the manufacture of the sweet substance, saccharin.—Prof. C. Graebe, *Apotheker Ztg.*, 1892, 359.

Sarsaparilla constituents.—According to Prof. Kobert's researches there are three glucosides present. *Parillin* ($C_{26}H_{44}O_{10} + 2\frac{1}{2}\ H_2O$), insoluble in water; *saponin* (sarsaparill-saponin) $5(C_{20}H_{32}O_{10} + 2\frac{1}{2}\ H_2O)$ soluble in water; *sarsasaponin* $12(C_{22}H_{36}O_{10} + 2H_2O)$ easily soluble in water and the *most poisonous* of the constituents. These substances injected into the blood, the red corpuscles are destroyed more rapidly than by most of the known poisons; they have action similar to the quillaia glucosides, but are weaker. These constituents are not absorbed into the system when administered, except by injured membranes, hence the questionable value of sarsaparilla. Kobert denounces the simultaneous administration of mercurials and sarsaparilla, since the lesions of the intestinal membranes frequently caused by the former may allow of the absorption of the poisonous sarsaparilla glucosides.—*Rundschau*, 1892, 611.

A new anæsthetic, similar to cocaine, has been found in *eugenol-acetamide*. By successive reactions eugenol is changed into eugenol-sodium, eugenol-acetic acid, ethyl eugenol-acetate and eugenol-acetamide. Crystallized from water it forms lustrous scales, from alcohol delicate needles melting at 110° C. Applied in the form of a fine powder, it produces local anæsthesia, without any caustic action; this effect, in conjunction with the strong antiseptic property of eugenol-acetic acid, speaks for the new compound securing a place in the treatment of wounds. Patents for its preparation have been applied for by the Farbwerken.—*Pharm. Centralhalle*, 1892, 441.

Jalapin.—The examination of the resin of so-called jalap stalks (root of Ipomœa orizabensis, *Ledanois*), has been continued under the supervision of Prof. Poleck, who regards this resin as probably identical with tampicin of Ipomœa simulans, *Hanbury*, and confirms its identity with scammonin. The formula, $C_{34}H_{56}O_{16}$, determined by W. Mayer in 1855, is confirmed; also the various derivatives, except jalapinol, which had also been noticed by Samelson in 1883, but which could not be isolated by Poleck. Jalapic acid is $H_2C_{17}H_{28}O_9$, and jalapinolic acid $HC_{16}H_{29}O_3$.—*Oest. Ztschr. f. Pharm.*, 1892, 391, 423 and 447.

The name *jalapin* should be discarded in favor of *orizabin*, the former name being improper and misleading.

Camphor for hypodermic injection is dissolved by Dr. Rosauer in warm paraffin oil.—*Zeitschr. f. Ther.*

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

Ozone as a therapeutic agent.—In a paper read recently before the French Society of Electrotherapy, Drs. Larat and Gautier prove that the clinical results observed from ozone as a therapeutic agent are far from being constant and are even in contradiction with the physiological experiences.—*Rev. Internat. de Bibl. Méd.*, July 25, 1892.

Decomposition of sulphurous acid by charcoal.—Berthelot has shown that at a red heat the reaction of the two bodies results in the production of carbonic oxide, carbon oxysulphide and carbon disulphide. Scheurer-Kestner (*Compt. rend.*, cxiv, 296) ascertained that at a white heat the reaction proceeds according to the equation $2SO_2+3C=2CO+CO_2+2S$.

Anhydrous crystallized sulphates have been prepared by P. Klobb (*Compt. rend.*, cxiv, 836) by mixing the metallic sulphate with excess of ammonium sulphate, and heating the mixture in a partly covered crucible until the latter salt has been completely expelled, but not increasing the heat to the decomposition of the former. In this manner $ZnSO_4$ has been prepared in colorless octahedra; $CuSO_4$ in gray needles; $CoSO_4$ in purplish red, and $NiSO_4$ in yellowish green octahedra.

Preparation of pure strontium salts.—Barthe and Falières suggest (*Bull. Soc. Chim.*, 3 ser., vii, 104) the following process: Dissolve strontianite or strontium sulphide in dilute hydrochloric acid, precipitate Fe and Al by ammonia, add excess of sulphuric acid, wash the precipitate by decantation until Ca has been completely removed, pour upon the precipitate excess of ammonium carbonate solution, agitate occasionally during two days, and then thoroughly wash the mixed strontium and barium sulphates and carbonates; treat this residue with dilute hydrochloric acid, filter after 24 hours, add to each liter of liquid 200 gm. sulphuric acid, spec. grav. 1·17, digest for several hours with 2 or 3 gm. of freshly precipitated strontium sulphate, which will be dissolved by the strongly acid liquid and precipitate any barium still in solution; then filter, evaporate to dryness, again dissolve in water and crystallize. Thus prepared the salt shows only the lines of strontium in the spectroscope.

Chloride of gold and sodium is recommended by Dr. Boubila as a

remedy in progressive general paralysis, augmenting the chances of resistance and retarding further development during the period of decline. It is given morning and evening in doses of 2 milligrams in a potion of 120 gm.; after fifteen days the dose is increased by 2 mgm., until 1 centigram is reached, which is continued for a fortnight. The treatment is then discontinued for a month, after which time it is resumed in the same manner. Under the conditions named these large doses are borne without inconvenience.—*Rev. internat. de Bibl. méd.*, July 25, 1892.

Calcium bisulphite is recommended by Henry Berg (*Eira, Stockholm*, xvi, through *Rev. internat. de Bibl. méd.*, 1892, p. 222) as a valuable antiseptic, which does not possess toxic properties, destroys infectious germs quickly and surely, is not caustic, does not alter the healthy tissues, and is prepared without difficulty and at a low cost in colorless solution, having a characteristic and easily recognized odor.

Antisepsis during epidemics.—E. Vallin in *Rev. d'hygiène*, February, 1892, directs attention to the necessity of frequent and prolonged antiseptic applications to the nasal cavities, the mouth and the throat, where morbific germs would be apt to lodge and multiply. Cinnamon water, anise water or a similar vehicle may be used for this purpose, to which may be added naphthol, salol, phenol or other antiseptic agent, which is not poisonous and does not attack the enamel of the teeth; for the nose a 3 per cent. solution of boric acid is a good application. To be effective these washes should be applied several times a day.

Synthesis of tartaric acid.—P. Genvresse (*Compt. rend.*, cxiv, 555) treated glyoxylic acid, $COH.CO_2H$, with zinc powder and acetic acid, heating finally on the water-bath, whereby it was converted into racemic acid.

The fruit of Prunus Laurocerasus, according to Camille Vincent and Delachanal (*Compt. rend.*, cxiv, 486), contains mannit and sorbit. The bruised cherries were allowed to ferment, the liquid treated with lead acetate, freed from lead and concentrated to a syrup, from which most of the mannit crystallized, more being precipitated by the addition of alcohol. The remaining liquid, by a complicated process, yielded sorbit identical with that obtained from mountain ash berries.

Olive oil.—Of 12 samples of olive oil examined at Montpellier in 1891, 4 were found to be pure, 4 to be mixtures with other oils, and 4 to be olive oil in name only. In the same report (*Rev. internat. d. Falsif.*, May, 1892) it is stated that the average quality of wine as well as milk has slightly improved during the same year.

Estimation of caffeine in tea.—After examining a number of methods for the assay of tea, many of which yield the alkaloid more or less colored, Cazeneuve and Biétrix recommend (*Répert. de Phar.*, May) the following, which yields the maximum amount of caffeine almost colorless: The alkaloid is liberated by lime, extracted with chloroform, the chloroformic solution evaporated, the residue treated with boiling water in the presence of a little animal charcoal, and the filtrate concentrated upon the water-bath.

Flavoring of tea.—Java teas, which are of no value for exportation, are being improved in flavor by the flowers of *Jasminum Sambac, Aiton, Aglaia odorata, Lour.*, and *Gardenia pictorum, Hassk.* According to *Rev. internat. des Falsif.*, an industry has been started at Cheribon, Java, to prepare such teas in imitation of Chinese tea.

Dose of digitalis.—In a paper read before the Académie royale de Médecine de Belgique (*Procès-verbal*, April, 1892), Dr. Masius shows that in doses generally considered as hypertoxic, digitalis may be taken not only without inconvenience, but that such massive doses will surely and rapidly prevent the dangers arising from cardiac weakness and from a high temperature. Administered in the dose of 4 grams in twenty-four hours, digitalis acts as a heart tonic, improves its energy, regulates pulsation and, therefore, combats veinous stagnation, œdema, dyspnœa, symptoms resulting from cardiac insufficiency; it reduces the febrile temperature, bringing it back to the normal, and in the absence of fever exerts no effect upon the temperature. The paralytic action of the heart is not to be feared, though such large doses of digitalis neither arrest pneumonia nor shorten its course, as has been stated to be done by Prof. Petresco. (See Amer. Jour. Phar., July, 1892, p. 367.)

Euphorbia antiquorum, Linné.—J. Santos Fernandez of Havana (*Revista de Cienc. med.*, April) has observed sixteen cases of inflammation of the cornea and conjunctiva resulting from having come into contact with the milk juice of this plant; the appearance of the organs was similar to that produced by burned lime or boiling

water. The treatment was similar to that followed ordinarily for this kind of lesions. The plant is originally indigenous to India, where it and its milk juice are employed medicinally.

Menthol in pruriginous skin diseases is prescribed by Dr. P. Colombini (*Gior. ital. d. mal. ven. e d. pelle*, 1892, through *Rev. internat. de Bibl. méd.*) in one of the following forms, according to the nature of the case:

Spirit: Menthol, 5 to 10; alcohol, 100.

Oil: Menthol, 10; expressed almond oil, 100.

Ointment: Zinc oxide, 25; starch, 25; menthol, 0·50 to 3; petrolatum, 50.

Dusting powder: Zinc oxide, 10; bismuth subnitrate, 10; menthol, 1 to 3; starch, 30.

Tænifuge.—In the case of a child troubled with *Tænia inermis*, pumpkin seed and pelletierine tannate afforded no relief; but the parasite was promptly expelled by an emulsion consisting of oleoresin of male fern, 3; tincture of vanilla, 3; syrup of turpentine, 25; water, 25, and gum arabic, 2 gm. The emulsion mixed with an equal quantity of milk was taken in one dose, and two hours later castor oil, 15 gm., was given.

The use of milk in artificial alimentation of infants is the subject of an essay recently presented to the Paris Academy of Medicine by Henry Drouet, whose observations lead him to the following conclusions:

(1) While some infants readily digest unboiled milk, the digestibility of milk is not in the least diminished, in the large majority of cases, by boiling.

(2) The nutritive power of boiled milk is to a large extent sufficient for the needs of infants.

(3) Boiled milk is preserved unaltered for a longer time than unboiled milk.

(4) Milk is often the vehicle of certain contagious disease-germs.

(5) Among these the germs of tuberculosis are most frequent.

(6) Contagion from that source is prevented by boiling the milk.

(7) It is absolutely indicated that milk intended for alimentation be boiled.

Constituents of leaves.—A. Étard (*Comp. rend.*, cxiv) has investigated some leaf-constituents accompanying chlorophyll. The

extract obtained with carbon disulphide was treated with alcohol and the insoluble portion recrystallized from benzol and afterward from acetic ether. The leaves of *Vitis vinifera* yielded colorless *vitol*, $C_{17}H_{34}O$, melting at 74° and boiling near 300° C. *Medicagol*, $C_{20}H_{42}O$, from *Medicago sativa*, melts at 80° and boils at 395°. *Bryonan*, $C_{20}H_{42}$, from the leaves of *Bryonia dioica*, melts at 69° and boils at 400°. The alcohol solution, obtained as stated above from grape vine leaves, contained fat acids and *vitoglycol*, $C_{23}H_{44}O_2$, the latter soluble in ether in the presence of alkalies.

This method may be used for separating the constituents into different groups. The extract obtained with carbon disulphide, on treatment with alcohol leaves glycerides and the higher alcohols and glycols behind, while alkaloids, alcohols, glycols, chlorophyll and acids are dissolved, the latter being separated from the other compounds by means of weak alkali solution. On treating the leaves, exhausted with CS_2 with hot alcohol, an extract is obtained which may again be separated into different groups of constituents by means of cold alcohol and by ether.

Artificial coloration of flowers.—The new industry of coloring flowers (pinks) green has been the subject of study by G. Planchon, who, in May last, reported his results to the Paris Conseil d'hygiène. It appears that the florists finding coloring matters frequently not rising in the tissues, overcome the difficulty by resorting to immersion. Basic coloring matters do not color flowers by ascension, but acid coloring matters generally are adapted for this purpose. The rapidity of ascension varies considerably; green acids rise quite rapidly, while blue, and particularly brown, acids penetrate only slowly to the flower. To color flowers by immersion, they are simply plunged into a solution of the appropriate dye stuff. Watery solutions have usually no effect, owing to the secretion present upon the surface of most petals; but by means of alcoholic solutions the flowers become dyed after the evaporation of the alcohol. Such flowers, however, are less handsome in appearance than those colored by ascension. Many of the coloring matters that may be employed for the purpose indicated are harmless, but even of the poisonous kinds a very small quantity only is usually required, too little to be hurtful.

Coloring matters in distilled waters.—L. Viron has observed (*Compt. rend.*, cxiv, 179) the formation of coloring matters in dis-

tilled medicinal waters, and isolated from green orange flower water three pigments, viz: one soluble in water with violet color, turning brown on exposure, secreted by a variety of *Micrococcus cyaneus;* one dissolving in alcohol with yellow color, secreted by *Bacillus aurantii;* and the third insoluble in alcohols, but dissolving in water with a green color. In some waters an organism was found producing a yellowish green fluorescence.

VOLATILE ORGANIC MATTER IN POTABLE WATER AND A SIMPLE METHOD OF ESTIMATING DISSOLVED FIXED AND VOLATILE ORGANIC MATTER IN WATER.[1]

By W. C. Young.

To determine the total organic matter, 1 litre of water, to which 0·5 gram of dried and ignited sodium carbonate is added, is distilled in a conical iron still of about 2 litres capacity, attached to a tin worm-condenser. The distillate is received in a graduated measure and when 970 cc. has been collected, the source of heat is removed, the still disconnected, the contents and washings placed in a platinum basin, and evaporated to dryness on a water-bath. The residue is then dissolved in a little pure distilled water, filtered through an asbestos plug into a platinum basin, dried on a water-bath, and subsequently heated for an hour in an air-bath at 150°. After cooling in a desiccator, the basin and contents are weighed. The residue is then ignited at a low temperature, cooled, and weighed and the loss noted. The ignited residue is dissolved in water, excess of sulphuric acid added, and then standard solution of potassium permanganate (1 cc. = 0·0001 gram O) until the color remains permanent after five minutes. The weight of oxygen lost, thus ascertained, is deducted from the loss on ignition, and the difference is the organic matter. To determine the fixed organic matter, the same course is followed, except that the sodium carbonate is not added until the concentrated water is transferred from the iron still to a plantium basin. To determine the volatile organic matter, the distillate from the last-mentioned process is placed in the still, together with 0·5 gram of sodium carbonate, and distilled until about 25 cc. remains in the still, afterwards proceeding as

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[1] *J. Soc. Chem. Ind.*, **10**, 883; *Jour. Chem. Soc.*, 1892, 921.

before, except that it is unnecessary to ascertain the oxygen lost by ignition. The result presents about two-thirds of the total volatile organic matter present; further small quantities can be recovered from the distillate by repeating the process.

By the employment of sodium carbonate the whole of the compounds of calcium, magnesium, and iron are precipitated, and any combined ammonia in the water is volatilized. There only remains sodium chloride, alkali nitrates, and uncombined silica to interfere with the loss on ignition being accepted as a measure of the organic matter present, and neither of these compounds being present in estimating volatile organic matter, the results may be accepted as free from objection on that account. As regards sodium chloride, the burning of the organic matter is so rapid (a few seconds suffices), and the temperature so low, that none is volatilized, or if a little is lost through excessive heating, the loss can be ascertained and due correction made. As regards alkali nitrates, provision is made in the process for ascertaining and correcting for the loss of oxygen by reduction of nitrates, but it is seldom of any great importance, and has never exceeded, in ordinary drinking waters, the equivalent of 0·07 grain per gallon. The presence of nitrates assists the burning of the organic matter very materially, and in the case of very foul waters, such as sewage effluents or seriously polluted waters, which rarely contain any, the author finds it advisable to add a drop or two of solution of potassium nitrate before the final evaporation. With regard to the uncombined silica, the author has never found it present, and if it should be, he does not think heat required to burn off the organic matter is sufficently great to cause it to decompose the sodium carbonate.

THE ACTION OF WATER UPON GLASS.

By F. Mylius and F. Forrester.

The authors summarize their rough researches in the following propositions, which they consider proved by their own observations and those of Pfeiffer and Kohlrausch:

(1) The solution of glass in water depends on a decomposition in which, in the first place, free alkali appears.

(2) The silica of the glass is secondarily dissolved by the free alkali.

(3) The constituents of the solution vary according to the conditions of digestion.

(4) The quantity of alkali which passes into solution from a given surface under given conditions is a measure for the attackability of the glass under these conditions.

(5) The attackability of surfaces of glass by cold water decreases at first very rapidly with the duration of digestion, and subsequently approach constant values.

(6) Different sorts of glass display a different persistence of the solution. (By this term Kohlrausch characterizes the relation of its solubility after a prolonged digestion to its original solubility.)

(7) The attackability of glass increases very rapidly with a rising temperature.

(8) The relation of the attackabilities of different kinds of glass depends on temperature.

(9) From glasses of equal attackability unequal weights may pass into solution.

(10) The attackability of good glass is decidedly decreased by a previous treatment with water.

(11) The worse a glass the less its attackability is diminished by treatment with water.

(12) The attackability of glass surfaces is modified by "weathering."

(13) After treatment with water, surfaces of glass have the property of taking up alkali from the solutions which have been formed and of giving it up again on renewed treatment with water.

(14) Potash glasses are much more soluble than soda-glasses, but the differences disappear in proportion as the glass is richer in lime.

(15) In the substance of glass vessels, which are not readily attacked by cold and hot water, the lime, alkalies and silica must bear a certain proportion to each other.

(16) Among the best known glasses plumbiferous flint glass is least soluble in water, but it is corroded at its surface and easily decomposed by acids.—*Zeit. Anal. Chemie; Chemical News*, August 5, p. 73.

Corrective for cod liver oil.—For disguising the taste of cod liver oil 100 gm. of it are recommended to be flavored with three or four drops of a mixture consisting of the volatile oils of wintergreen 4, sassafras 4, and neroli 2 parts.—*Gazz. d. Ospit.*, 1892, No. 73.

THE DETECTION AND ESTIMATION OF MINUTE QUANTITIES OF LEAD IN THE PRESENCE OF COPPER AND IRON.

By Frank L. Teed, D.Sc.

I propose first to refer to the detection of lead in sulphuric acid. The usual method is by dilution with water, but I found, some years ago, that by adding hydrochloric acid to the sulphuric acid, and keeping it cold, a much smaller quantity of lead could be detected than by adding water, or even by adding water and subsequently an equal volume of absolute alcohol. The lead is precipitated as chloride as a peculiar pearly opalescence. I patented this process for the purpose of removing lead from sulphuric acid, which it does perfectly, but sulphuric acid manufacturers assure me that there is no commercial value in any process that would effect such a result. Although leaving something to be desired as a patent, the process is still of use as a test on account of its delicacy. It can be applied to the detection of minute quantities of lead in organic substances. Take, for instances, a substance which is generally, I may say invariably, contaminated with lead—tartaric acid. The lead is a little difficult of detection by the ordinary process, because sulphide of lead, as we know, is more or less soluble in tartaric acid. If the tartaric acid is ignited, a large proportion of the lead is, of course, lost, but some is left, and there is sufficient in the small quantity of ash, if digested with pure sulphuric acid, to show the characteristic reaction on the subsequent addition of hydrochloric acid. While on the use of hydrochloric acid as a test for lead in sulphuric acid, I may mention that nitric acid is also a test for lead in sulphuric acid; but it is not nearly so delicate as hydrochloric acid. If to a sample of commercial sulphuric acid which is very rich (*i. e.*, very impure) in lead, nitric acid is added, the lead mainly settles out, but still, after treatment with nitric acid, lead can be detected by the addition of hydrochloric acid. Hydrochloric acid gas is insoluble in sulphuric acid, and if passed through strong sulphuric acid which is highly contaminated with lead, for an hour or more, nothing whatever happens, but if to that acid in a test tube a single drop of the solution of hydrochloric acid, or a crystal of common salt is added, the characteristic precipitate at once appears.

The main object of my paper was to draw attention to the difficulty of detecting and estimating minute quantities of lead in pres-

ence of copper and iron. There are certain temperance drinks, such as lemonade and soda water, which, in the process of manufacture, are liable to contain at least these three metallic impurities. In the case of lemonade, the lead occurs partly in the tartaric acid used, and partly comes from the use, perhaps one ought to say abuse, of lead pipes for transferring the charged solutions; and the copper comes from the copper cylinders (although tin-lined) in which the drink is charged with carbonic acid. Hence the difficulty arises of detecting a highly poisonous metal like lead, in the presence of a mildly poisonous metal like copper, and a non-poisonous metal like iron. The most delicate reaction for both lead and copper is, I believe, the precipitation as sulphides, either by sulphuretted hydrogen or ammonium sulphide. The amounts present can, of course, be estimated colorimetrically by comparison with known quantities. I find the sulphide reaction far more delicate in the case of copper than the ferro-cyanide reaction. I do not think the hundredth of a grain of copper in a gallon of liquid could be detected by means of the ferro-cyanide reaction without concentration, but ammonium sulphide would easily detect it. The objection to this reagent is that it does not distinguish between lead and copper. To effect this distinction I simply make use of the well-known fact that sulphide of copper is soluble in cyanide of potassium, whereas sulphide of lead is not. To perform a determination:—Place a measured quantity of lemonade, or other liquid, in a cylinder or white basin. Add a few cc. of ammonia and a little cyanide of potassium, then add a minute quantity of ammonium sulphide. Down comes the lead, but not the copper. Then imitate the color by known quantities of lead precipitated under similar conditions. Iron does not at all interfere with the test. If an iron salt is added to lemonade, for instance, and made alkaline with ammonia, the iron is kept in solution by the tartaric acid, and on addition of cyanide of potassium is converted into a ferro or ferri-cyanide, not precipitable by ammonium sulphide. In the case of liquids not containing tartartic acid, it is easy enough to add a little in the event of iron being present.—*The Analyst*, August, 1892, p. 142.

Santonin has been recommended in enuresis caused by irritation of the vesical sphincter, in doses of ¼ to ½ grain, given with sugar.—*Quarterly Therap. Rev.*, July, 1892.

VOLUMETRIC DETERMINATION OF MERCURY.

By Rod. Namias.

The volumetric process to be explained is applicable only to mercuric chloride, into which every other compound must be previously converted. The nitrate must be treated with hydrochloric acid in excess, and evaporated to dryness; the mercurous salts are submitted to evaporation in presence of hydrochloric acid and of potassium chlorate.

The evaporation must be conducted with care at a temperature below that of ebullition, so as to avoid any loss of mercuric chloride by volatilization.

The process depends upon the following principle: If to a solution of mercuric chloride, slightly acidified with hydrochloric acid, we add a solution of stannous chloride, the mercuric chloride is reduced first to the mercurous state and then to metallic mercury. But whilst the first reaction is nearly instantaneous, the second takes a longer or shorter time, so much the longer as the excess of the stannous chloride is less.

If we have a reagent by which we can recognize the moment when the stannous chloride is in excess for the first reaction, and begins to produce the second, we may by this means determine the mercury volumetrically.

The reagent for detecting the presence of stannous chloride in excess is sodium molybdate. I dissolve a small quantity of molybdic anhydride in a solution of sodium hydrate or carbonate; I steep in this liquid a morsel of filter-paper, which I spread out whilst wet upon a plate of porcelain. The solution of molybdate ought to be freshly prepared, and the paper of good quality; it must not take a yellow tint on immersion in the alkaline liquid. The paper must be steeped in the molybdate only a little time before the experiment, so that it may not have time to dry.

The paper thus prepared shows a relatively slight excess of stannous chloride, which communicates to it according to its quantity a color varying from the lightest sky-blue to an intense blue. This color is due to the reduction of the molybdic acid. Ammonium molybdate, less stable than sodium molybdate, is less fit for use.

The determination of the value of the stannous solution may be made by means of a standard solution of iodine; but it is preferably

effected by operating upon a known quantity of pure mercuric chloride obtained by sublimation.

If we operate with iodine we obtain a slight error in excess due to the small quantity of stannous chloride, which must be used in excess to mark the end of the operation by spotting upon the molybdate paper. In any case it is well to determine the standard of the stannous solution by means of iodine approximately, if not exactly; this serves as a control, and facilitates at the same time the exact titration by means of mercuric chloride.

To prepare the solution of stannous chloride I dissolve 2 to 3 gm. tin by means of hydrochloric acid, and dilute it to 1 litre. This solution is preserved in an apparatus which prevents alteration by contact with air. I determine its strength as follows: 0·2 to 0·4 gm. of mercuric chloride weighed exactly are dissolved in 50 cc. of distilled water, acidulated with ½ cc. of concentrated hydrochloric acid. Into this cold solution the stannous solution is allowed to flow from a burette. If the determination of the standard has been previously made with iodine, we may pour in at once, without fear of over-stepping the limit, the volume as determined by calculation from the titration with iodine; we then add the liquid drop by drop, stirring carefully, and each time putting a drop of the mixture with the stirring-rod upon the molybdate paper. An excess of a few drops of stannous liquid turns the paper to a pale blue, which becomes manifest after a few seconds, and which an experienced eye easily recognizes.

To obtain a well-marked coloration, it is necessary to use an excess of from 0·3 to 0·5 cc. for 50 cc. of liquid. The small quantity of mercurous chloride placed upon the molybdate paper whilst "spotting" has no injurious influence upon the result.

The proportion of free hydrochloric acid contained in the liquid should be about 0·5 cc. to 50 cc. of liquid; a larger proportion may occasion errors from its action upon the molybdic acid in presence of filter-paper.

To obtain exact results we must operate each time exactly as when standardizing the liquid. We must, as far as possible, operate upon the same volume of liquid, in presence of the same proportion of hydrochloric acid, and obtain spots of the same intensity upon the molybdate paper.—*Revue Universelle des Mines*; *Chem. News*, Aug. 19, p. 90.

PEPTONE SALTS FROM GLUTIN.[1]

By C. Paal.

Mineral acids act on glutin in a similar manner to pepsin and trypsin, yielding peptones, which combine with the acid present to form salts; these dissolve not only in water, but also, unlike the free peptones, in absolute ethyl and methyl alcohol. For their preparation, 100 parts of purest commercial gelatin are warmed on the water-bath with 160 parts of water and 40 parts of concentrated hydrochloric acid until a portion of the product is completely soluble in a large quantity of absolute alcohol, and the whole is then poured into 4–5 vols. of absolute alcohol. After filtering off the inorganic salts, the solution is precipitated with ether, the residue redissolved in alcohol, and the solution evaporated under diminished pressure. The gultin peptone hydrochloride thus obtained forms a brittle, white, vesicular mass, and is readily soluble in water, methyl alcohol, ethyl alcohol, and acetic acid, somewhat less easily in propyl alcohol, sparingly in amyl alcohol, and insoluble in ether, carbon bisulphide, and benzene. It is very hygroscopic, remains unchanged at 130°, and gives the characteristic peptone reaction with biuret; it is lævorotatory in aqueous solution $[\alpha]_D$ being about $-60°$. The quantity of hydrochloric acid found in the different preparations varied from 10·5–12·5 per cent., whilst the ash is only about 0·5 per cent. If stronger hydrochloric acid than that mentioned above is employed, or if the heating be continued for a longer time, salts containing a larger percentage of acid can be obtained.

The quantity of carbon and hydrogen varies considerably in the different preparations, the former being in some cases higher than that of glutin (for which the author finds C = 50·1, H = 6·68), and in others less; this is due to the fact that in most cases more or less etherification has taken place during the treatment with alcohol; the compounds formed may, however, be hydrolyzed by long-continued boiling with water. The salts were found to be almost free from sulphur.

The fact that by varying the strength of the hydrochloric acid, and the time allowed for the reaction, compounds containing a varying amount of acid are obtained, tends to show that these salts

[1] *Berichte*, **25**, 1202–1236; *Jour. Chem. Soc.*, 1892, p. 895.

are mixtures of compounds representing different degrees of peptonization; this has been confirmed by subjecting the alcoholic solutions to fractional precipitation with ether, and subsequent fractional crystallization of some of the precipitates from alcohol. The salts thus obtained contain a varying percentage of acid, their solubility in alcohol decreasing with the decrease in the proportion of acid. A much more satisfactory separation is obtained by subjecting an aqueous solution of the salts to dialysis, for although they have not been obtained crystalline (probably owing to their hygroscopic nature), they, nevertheless, pass through the dialyser, and must be regarded as crystalloids. In this manner, a salt containing 10·56 per cent. of acid was separated into two portions, that passing through the dialyser containing 14·19 per cent. of acid, and the residue only 5·79, the latter being insoluble in absolute alcohol. The percentage of carbon and hydrogen, calculated on free peptone, remains fairly constant, except in so far as the salts passing through the dialyser are concerned; the decrease in this case is due to the fact that in evaporating the large volume of solution obtained, a quantity of alcohol is split off. It was found that only those salts containing 10 per cent. of acid and upward are soluble in absolute alcohol, and those fractions which are only just dissolved are much less soluble in propyl alcohol, and insoluble in amyl alcohol; the salts containing less than 10 per cent. are all readily soluble in methyl alcohol, and these also dissolve in alcoholic solution of the salts containing more acid.

The same separation may be brought about by treating the alcoholic solution of the salt with mercuric chloride; two mercurochlorides are thus obtained, one of which separates out at once, and the second on the addition of ether; these correspond to the insoluble and soluble hydrochlorides, and may, like the mercurochlorides of the free peptones, be employed for therapeutical purposes.

If glutin be warmed with a weaker acid than that first mentioned, a salt may be obtained which dissolves in methyl alcohol, but is insoluble in ethyl alcohol, and contains 6·85 per cent. of hydrochloric acid. It closely resembles the salts already described, and may, like them, be separated into fractions containing different percentages of acid, that containing the highest percentage being somewhat soluble in ethyl alcohol. By the action of pepsin on

glutin in presence of very dilute hydrochloric acid, a peptone salt is also obtained which closely resembles the salt last described, but is not completely soluble in cold methyl alcohol; it is separated by dialysis into two fractions, one of which contains 2·97 per cent. HCl, and is almost insoluble in methyl alcohol, whilst the other contains 11·13 per cent. HCl.

In all cases it appears that the salts formed either by the action of acid or of pepsin and acid are separable into two portions containing a maximum and minimum percentage of acid, and it therefore appears probable that the molecule of glutin contains two atom-complexes, which in the first stage of the reaction yield two separate molecules. These differ greatly in the resistance they offer towards further change, the one which forms salts containing a larger quantity of acid, being more readily converted into its ultimate products of decomposition, namely, the amido-acids.

The acid in the glutinpeptone salts is very firmly combined, and great difficulty was experienced in converting the salts into the free peptones. This was first accomplished by adding a large excess of alkali and removing the inorganic substances by dialysis, but great loss of substance also takes place. It was then found that the change may be brought about quantitatively by adding a slight excess of pure silver sulphate, filtering from silver chloride, removing the excess of silver with hydrogen sulphide, and the sulphuric acid with the necessary amount of baryta-water. The glutinpeptones thus obtained are soluble in all proportions in water, but insoluble in alcohol and ether; their aqueous solutions have an acid reaction towards litmus, but do not turn Congo paper blue. On analysis, it was found that the percentage of carbon was rather less, and that of hydrogen rather more, than in the case of glutin; this is in complete agreement with the supposition that they are products of hydrolysis.

Attempts were also made to determine the molecular weights of these substances by the cryoscopic method in aqueous solution and by the boiling-point method in aqueous and methyl and ethyl alcoholic solution. The results show that the molecule of peptone salt becomes smaller as the percentage of acid increases; further, that the salts are dissociated in aqueous and methyl alcoholic solutions, but not in ethyl alcoholic solution, for the molecular weight deduced from the boiling point of the solutions in the last solvent is double

that deduced in the same manner from the boiling point of the solutions of the same salt in the other two solvents. In water and methyl alcohol, the molecule of the salt is therefore dissociated into 2 mols., whence it follows that these salts consist of 1 mol. of peptone and 1 mol. of hydrochloric acid. The molecular weight of the free peptones was found to be about 300 in three cases, and about 215 in the fourth case, and that of glutin itself about 900.

The author concludes that the glutin molecule is resolved with assimilation of water into peptone molecules of gradually decreasing molecular weight, till a point is reached at which the peptonization ceases, and the simpler peptones are resolved into amido-acids, lysin, lysatin, etc. As, however, the molecule of the proteids consists of two atom-complexes which present a varying resistance to further hydrolysis, the simpler products of decomposition are always mixed with unaltered peptones.

NOTE ON DENITRATION OF PYROXYLIN.

By Durand Woodman, Ph.D.

An interesting reaction, but one which seems to be considered of little practical importance, is that described in the brief references herewith given.

"Some nitrognous substances, as albumen and pyroxylin, are reduced to a less complex form by certain deoxidizing agents, as ammonium sulphide, ferrous chloride, sulphurous acid and others, the change consisting in the loss of NO_2."—(*Gmelin, Hand-book, Vol. XVIII.*)

"A solution of potassium sulphydrate especially if mixed with alcohol, reproduces the original cotton (from pyroxylin) with formation of KNO_3 and a little ammonia."—(*Watts' Dict. IV, 778.*)

"By the action of reducing agents, such as ferrous chloride or acetate, or potassium sulphydrate, the cellulosic nitrates are converted into cellulose even by digestion at the ordinary temperature. By boiling with a solution of stannous oxide in KHO, the nitrocelluloses are dissolved, with conversion into cellulose, which is precipitated in flocks on neutralizing the liquid."—(*Allen, Com. Org. Anal., I, 327.*)

Samples of ordinary photographic collodion film and thin sheets of celluloid free from coloring or mineral matter, were reduced in a bath of ammonium sulphide.

It is necessary to dilute the reducing agent somewhat and keep the bath cooled by immersion in water during the early stages, or the reduction takes place with such rapidity that a very considerable rise of temperature results, accompanied by a deposit, in and on the material, of finely divided sulphur, which can be removed only by solvents. A too rapid reduction and consequent rise of temperature is also not without seriously injurious effect on the tenacity of the resulting cellulose film.

After washing for several hours in running water, the material is dried and will now burn quietly like wood or paper. Analysis of the material so obtained gave the following result, a parallel analysis of ash-free filter paper being made at the same time for comparison:

	Denitrated Pyroxylin.			Cellulose from Ash-free Paper.
C,	41·86	42·03	41·76	44·00
H,	6·14	6·18	6·07	6·32
O,	50·68	50·47	50·85	49·68
S,	·60	—	—	—
Ash,	·72	—	—	—
	100·00	—	—	100·00

The sheets of cellulose obtained by the denitrating process are very much reduced in area and increased somewhat in thickness, as compared with the original sheet of pyroxylin.

Measurements were made of a number of sheets before and after treatment to obtain figures expressing the approximate amount of shrinkage.

The average measures were:

	Length, Inches.	Breadth, Inches.	Thickness Inch.
Before treatment,	15·0	10·0	·0057
After treatment,	11·76	7·5	·007

The percentage decrease of area and volume (approx.) were as follows:

Number.	Area Decrease. Per Cent.	Volume Decrease. Per Cent.
1,	35	21
5,	40	37
7,	47	29
8,	46	22
9,	48	34
10,	45	28
11,	45	33

The decrease in volume can only be considered a rough approximation.

The material is slightly hygroscopic, quite strong, elastic, becoming somewhat brittle when very dry, and is translucent or transparent according to the purity of materials used in manufacture and thickness of the sheet. *Sp. Gr.*, 1·545

One of its most interesting practical applications has been the preparation from it, of incandescent electric lamp filaments, its homogeneity of structure, when carefully prepared, rendering it a promising substance for this purpose. As the reducing action will not penetrate beyond a few thousandths of an inch, the process can be successfully operated only on thin sheets of pyroxylin.—*Jour. Amer. Chem. Soc.*, 1892, p. 114.

VEGETABLE AMYLOID.[1]

By E. Winterstein.

The substance described under the name "amyloid" is a constituent of the cell walls of certain plants, and gives the same coloration with iodine as starch does. According to Reiss (*Landw. Jahrb.*, **18**, 733), on hydrolysis with dilute sulphuric acid, it yields considerable quantities of glucose, but as the material used by him also contained cellulose, this statement is open to the objection that the latter was the source from which the glucose was obtained. The author has therefore prepared pure samples of amyloid, and examined its behavior on hydrolysis, with results very different from those obtained by Reiss.

To prepare the amyloid, the seeds of *Tropæolum majus* were extracted successively with ether, cold alcohol, dilute ammonia, dilute soda, and cold water; the residue was boiled with water, fil-

[1] *Berichte*, **25**, 1237–1241; *Jour. Chem. Soc.*, 1892, p. 803.

tered, and the solution precipitated with alcohol. The amyloid separates as a jelly, and is purified by redissolving in water and again precipitating with alcohol. It then forms a colorless, transparent jelly, which dries in the desiccator to an amorphous, vesicular mass, and is colored blue by iodine, the color disappearing on warming. Its aqueous solution is dextrorotatory ($[\alpha]_D = 93{\cdot}5°$), and it is not converted into sugars by diastase; on oxidation with nitric acid, it yields mucic acid, and with hydrochloric acid gives 15·44 per cent. of furfuraldehyde. On hydrolysis with 2·5 per cent. sulphuric acid, it yields galactose, together with a smaller quantity of another hexose of lower dextrorotatory power, and a pentose which yields trihydroxyglutaric acid on oxidation, and is therefore probably xylose, the second hexose being probably glucose. If the residue, after extracting the seeds with hot water, be boiled with 3 per cent. sulphuric acid, it yields further quantities of galactose and xylose.

The author, therefore, regards amyloid as a substance corresponding somewhat with starch or cellulose, but derived from galactose and xylose, instead of from glucose. Whether the substance is really homogeneous is not yet certain, but the fact that the amyloid prepared from the seeds of *Pæonia officinalis* yields almost the same quantities of mucic acid and furfuraldehyde is in favor of this supposition.

THE ANALYSIS OF COAL TAR PREPARATIONS.[1]

By H. Helbing and Dr. F. W. Passmore.

The value of preparations of tar oils as disinfectants is becoming daily more and more appreciated by the Medical profession and Sanitary experts. Yet whilst no doubt remains that the tar compounds are disinfectants *par excellence*, very little is known with respect to the determination of the individual value of these tar preparations by a scientifically accurate and yet easy method.

That the disinfectant value of such compounds may be established by bacteriological investigation is an idea that at once presents itself to the mind, and the method is certainly of very great value in experimenting with a new disinfectant of definite composition. Bacteriological research is, however, not of so much use in the com-

[1] Reprinted from *Helbing's Pharmacological Record*, July, 1892.

parison of tar oil preparations, owing to the element of uncertainty that enters into individual experiments and the great variations in the results occasioned by very slight deviations in the experimental conditions, such as are certain to obtain in the hands of different investigators. As the germicidal values of the principal chemical constituents of the various tar preparations in commerce are known, it appears indeed preferable to abandon direct bacteriological investigation and define the composition of the product from a chemical point of view, from which its true value as a disinfectant can be easily and reliably estimated.

Composition of Tar Oils.—The tar oils, whether distilled from coal, or wood, or bones, are, however, of such a complicated character that the task of separating them and estimating each individual constituent would be not only formidable but absolutely impracticable in commercial analysis. Nor is such a detailed investigation at all necessary to arrive at an approximate and reliable valuation of tar oils or preparations made from tar oils as disinfectants. Roughly speaking, the constituents of tar oils may be classified into three divisions: (1) The Tar Acids. (2) The Bases. (3) The Hydrocarbons, according to whether their acidic or basic nature most predominates, or whether they are of an entirely neutral character like hydrocarbons.

In the tar oils distilled from coal, which, of the different tar products, are generally or indeed almost without exception employed in the crude state in the manufacture of disinfectants, the hydrocarbon constituents form by far the larger proportion, and even these vary in chemical character and disinfectant value according to the origin and nature of the coal, the mode of distillation, the regulation of the temperature of distillation, and numerous minor details that more or less affect the chemical changes occurring during distillation and the composition of the resulting products. Amongst the ordinary commercial coal tar oils three products are especially distinguished as

Light Oil, the fraction below 150° C., with a specific gravity of 0·9, and consisting principally of benzene and its homologues, and some naphtalene;

Medium Oil, distilling between 150° C. and 210° C., possessing a specific gravity of about 1·01, and containing principally naphtalene and other hydrocarbons, carbolic acid, cresols and bases; and

HEAVY OIL, boiling between 210° and 300° C., having the specific gravity of 1·04, and containing naphtalene, anthracene, phenanthrene, and other hydrocarbons.

The tar oils from bones and wood are respectively richer in basic constituents and phenoloid compounds, and therefore afford a better source than the coal-tar oils for the isolation and preparation of definite compounds, so that they are less employed in the crude state.

Estimation of Tar Oils.—The physical characteristics of boiling point, specific gravity, viscosity, and solidifying point, although still frequently solely relied upon, afford very little reliable evidence as to the composition of the product. As the hydrocarbons, tar acids, and bases have very different and distinct values with regard to their disinfectant properties, the first step in arriving at a true knowledge of the chemical composition of the oil is the separation of these three classes of compounds. This is effected by shaking the tar oil with concentrated caustic soda solution, containing about ten per cent. hydrate, whereby the phenols and other acid constituents are removed, and either go into solution in the alkaline liquid or form a separate layer of sodium salt.

In technical analysis this process is carried out in a graduated tube, and the difference in volume of tar oil before and after the soda treatment gives the approximate quantity of tar acids present. The carrying out of the process is, however, accompanied by certain difficulties of manipulation arising from the viscous nature of the liquids and the difficulty with which they separate into layers. If much naphtalene be present, it is also liable to crystallize out when the acids are removed from the hydrocarbons and still further increase the difficulties. To avoid this it is customary to add ordinary ether or petroleum ether to the oil before shaking with soda, as these substances not only act as solvents of the hydrocarbons and prevent any tendency to crystallize, but also by mixing with them lowers their specific gravity and allows them to separate more easily. When the separation is complete the upper layer containing the hydrocarbons is removed, and the ether allowed to evaporate and the volume measured. The bases which are retained in solution by the hydrocarbons can be removed from the latter by treatment with dilute mineral acids and the bases obtained from the acid liquors in the form of salts.

This process affords an approximate idea of the composition of the tar oil, but it may be still further extended without much increase of manipulative details, so as to give a fuller idea of the disinfectant value of the product, in a manner that has proved extremely useful to us in the examination of Jeyes' Fluid and other coal-tar preparations. We refer to the more complete isolation of the constituents by a repetition of the above processes, submitting the hydrocarbons and tar acids to fractional distillation and weighing the different fractions.

Determination of Hydrocarbons.—For the analysis of a very concentrated coal tar preparation like Jeyes' Fluid 50 grammes suffices for examination, but of course more dilute preparations that contain comparatively small quantities of the disinfectant principles require that a larger quantity should be taken to obtain equally reliable results. After determination of the specific gravity and alkalinity of the preparation a weighed quantity is diluted with an equal or even with the double volume of ordinary ether, and then extracted several times with 10 per cent. caustic soda solution. The amount of soda solution employed for the above quantity should be about 100 cc. for the first shaking, the alkaline liquor then run off, and the ethereal layer containing the hydrocarbons and bases again shaken repeatedly with successive portions of 50 cc. soda solution until nothing further is removed. This stage is shown by the colorlessness of the alkaline layer, or by the absence of any tar acids separating when the alkaline liquor is acidified, four or five shakings generally effecting the required separation.

The ethereal layer is further washed once or twice with water to remove the greater part of the adherent alkali, and the alkaline liquors and washings mixed and again shaken once with ether to remove any naphtalene or other hydrocarbons that may have been dissolved in the alkaline liquor, or rather in the ether dissolved by the water. This quantity is appreciable, although not sufficient to seriously affect the analytical results, so that this operation may be left out, although a fairly liberal use of ether tends to increase the accuracy of the results.

The ethereal solution of the hydrocarbons is then extracted three or four times with about 20 cc. of dilute (1 : 4) sulphuric acid to remove the bases, washed with water to remove the excess of acid, and then dried by the introduction of a few pieces of calcium

chloride. The greater portion of the ether is distilled off on the water-bath, and the oily residue introduced with the aid of a little ether into a small weighed distillation flask with side tubulure in the neck.

On distillation with a free flame the temperature in the flask, measured by a thermometer the bulb of which should be above the level of the boiling fluid, remains under 40° or 45° C. until the last traces of ether have distilled over. The temperature then suddenly rises to 100°, 150°, or even 200° C., according to the character of the coal-tar oil that has been employed, and the hydrocarbons then commence to distil over.

The hydrocarbons that distil below 200° C. are generally of a limpid fluid character, but the fraction slightly above that temperature frequently solidifies owing to the presence of naphtalene, whilst above 250° C. the hydrocarbons that distil over are again of a liquid character, though distinctly viscous. Above 300° C. the distillation may be discontinued and the three fractions indicated weighed, as well as the undistilled portion in the flask, which generally becomes solid on cooling from the presence of anthracene and phenanthrene. The total weights give the amount of hydrocarbons in 50 grammes of the preparation, or multiplied by two the percentage. Not only does the amount and composition of the hydrocarbons vary much in different preparations, according to the degree of dilution and different tar oils employed, but the relation between amount of hydrocarbons and tar acids present in the preparations examined by us was also found to be very variable, ranging from equal parts of hydrocarbons and acid constituents in standard fluids to 20 parts hydrocarbons to 1 part acids in other preparations, which are consequently of inferior disinfectant value.

Although the hydrocarbons, especially those of higher boiling points, have a distinct antiseptic and disinfectant value, yet the tar acids, consisting principally of carbolic acid and the cresols, generally referred to under the name of cresylic acid, it is well known possess these properties to a far higher degree. The value of coal-tar preparations as disinfectants in fact depends to a large extent on the amount of tar acids present.

Determination of Acid Constituents.—The tar acids, including as they do phenol and its homologues, are not generally acids in the true chemical sense of the word, but so far partake of an acidic

character that they dissolve in not too dilute solutions of alkalies. For their determination the alkaline liquors removed from the hydrocarbons in the previous experiment are subjected to further treatment. Without driving off the ether dissolved in the liquors they are made decidedly acid with sulphuric acid, and the liberated tar acids that rise to the top of the solution are removed in a separating funnel. The acid liquor is then shaken twice with small quantities of ether, and the ethereal solution added to the remainder of the tar acids. The acid liquor now only contains inorganic bodies, either originally present in the preparation or introduced during its analysis, and traces of bases that owing to their solubility in water were not entirely removed from the solution by ether when alkaline.

The ether is distilled off on the water-bath from the tar acids after they have been washed with water and dried with calcium chloride. The residual acids are then introduced into a weighed fractionating flask of suitable size with the aid of ether, and subjected to distillation in the same way as the hydrocarbons. Carbolic acid boils at 183° C., whilst the three homologous cresols which constitute the chief constituents of cresylic acid boil, respectively, about 185°, 195° and 200° C. As soon as the last traces of ether have been distilled off, the temperature rapidly rises above 180° C., when the phenols commence to distil over, although, owing to the proximity of their boiling points, it is impossible to separate them to any extent by fractional distillation.

As carbolic acid possesses very dangerous toxic properties, whilst the homologous cresols are equally or even more efficient as disinfectants, and at the same time comparatively innocuous to the human system, it is preferable that carbolic acid should not be included to any great extent in the acid constituents of coal-tar preparations.

As it is stated that Jeyes' Fluid, which contains about 40 per cent. of acid constituents, and may therefore be regarded as possessing very high disinfectant properties, is free from carbolic acid, we endeavored to determine whether it was possible to detect small quantities of this substance in a mixture of cresols and analogous compounds. Operating upon small quantities this is impossible, as the ordinary color tests for carbolic acid and the formation of an insoluble bromine compound are useless, since the same reactions occur with the higher phenols.

The only method found practicable consisted of an adaptation of the commercial process for the separation of phenols, by fractionally precipitating the alkaline solution of the tar acids with small quantities of mineral acid, in which case the carbolic acid is concentrated in the first fraction, and, if necessary, the treatment repeated. Necessarily the results obtained increase in accuracy with the quantity of tar acids treated and by operating on 200 grams of the acids in this way we convinced ourselves that the above preparation contained less than one-quarter per cent. carbolic acid.

Higher homologues of phenol than the cresols are not found in any quantity in most of the commercial preparations, and the temperature therefore again rapidly rises above 210° C. This fraction should therefore be collected separately and weighed. If any considerable quantity still remains in the distillation flask, it generally consists of resin acids and their anhydrides derived from resin soap added for purposes of emulsification. These commence to distil about 250° C., but the greater part passes over at a temperature above that registered by a mercurial thermometer, and hardens again to a resin-like mass on cooling. From the analytical as well as the disinfectant point of view this emulsifying agent is far preferable to other bodies, like gelatine and saponin, that are employed for a similar purpose in some preparations, since the latter form emulsions in the analytical processes that make the separation of the ethereal layer very tedious, and considerably increase the difficulties of the analyst.

Determination of Bases.—The basic constituents of coal-tar preparations are extracted from the hydrocarbons with dilute sulphuric acid in the manner above described, after the removal of the acid constituents. They include pyridine and chinoline and their homologues, the separation of which would prove a difficult and unnecessary task. Two methods may be employed for their estimation, either of which, however, only gives an approximate value, the titration of the acid solution of the bases with a standard alkaloidal reagent or of the alcoholic solution with standard acid, calculating the amount of bases from an empirical combining weight, or the formation and direct weighing of their neutral salts. We adopted the latter process as the simplest and as affording perhaps the most reliable results, the sulphate of the bases being prepared in preference to the hydrochlorides as recommended in some text-books,

since the latter volatilize and decompose on evaporation to dryness, as the odor of the escaping vapors evidences.

For this purpose the free acid in the sulphuric acid solution was nearly neutralized with soda, evaporated nearly to dryness. Then finally neutralized and evaporated to complete dryness. By treatment of the residue with nearly absolute alcohol only the organic salts go into solution; the alcoholic solution is therefore filtered from the sulphate of sodium, evaporated to dryness and weighed. The result gives the amount of bases present as sulphates.

In the foregoing pages we have sketched an analytical process for coal-tar preparations which has given accurate and reliable results in our hands, and admits of a more complete examination of the products than the methods hitherto connectedly published. We hope that the information will prove valuable at the present time in aiding anyone examining and comparing the various coal-tar disinfectants in coming to correct conclusions as to their respective composition and the percentage of cresols on which depends the value of the preparation as a disinfectant.

MENTHOL.[1]

By A. Berkenheim.

When menthol, $C_{10}H_{19}OH$, is added in successive small portions to a carefully cooled mixture of phosphoric chloride and light petroleum, there is formed from 100 grams of menthol (1) 70 grams of *menthyl chloride*, $C_{10}H_{19}Cl$, an optically inactive liquid boiling at 209·5–210·5° (uncorr.), and having the sp. gr. at 0°/0° = 0·9565 and at 15°/15° = 0·947, and (2) 15 grams of a menthene, $C_{10}H_{18}$, boiling at 167–169° (uncorr.). This menthene, when warmed with phosphoric chloride, yields a *chloride*, $C_{10}H_{17}Cl$, boiling at 204–208°. Menthyl chloride is not affected by zinc and hydrochloric acid, and is converted by zinc dust and acetic acid into the above-mentioned menthene; but it is reduced when heated for 30 hours at 200° with hydriodic acid and phosphorus in a sealed tube. *Menthonaphthene*, $C_{10}H_{20}$, boiling at 169–170·5°, is thus obtained. It is an inactive liquid, possessing only a feeble odor when pure, and the sp. gr. at

[1] *Berichte*, **25**, 686–698; *Jour. Chem. Soc.*, 1892, p. 866.

0°/0° = 0·8067 and at 15°/15° = 0·796. It does not take up bromine, is not attacked by strong sulphuric or nitric acid at the ordinary temperature, gives when heated with fuming nitric acid a liquid nitro-derivative, and with bromine and aluminium bromide a viscid bromide. If the heating in the sealed tube is continued for only 15–20 hours, some *menthyl iodide*, $C_{10}H_{19}I$, is also obtained; this, when not quite pure, boils at 140–143° under 30 mm. pressure, and has a sp. gr. at 15°/15° = 1·357. When chlorine is allowed to react with the vapors of menthonaphthene, an inactive liquid is obtained, volatile with steam, boiling at 208–210°, and with a sp. gr. at 0°/0° = 0·9553. It would seem to be identical with the above-mentioned menthyl chloride. When menthyl chloride (70 grams) is heated with potassium acetate and acetic acid for 20 hours in a sealed tube at 150°, some (20 grams) is left unaltered, and some menthene, $C_{10}H_{18}$ (25 grams), is formed. This menthene boils at 170–171°, has sp. gr. at 0°/0° = 0·8287 and at 20°/20° = 0·816, and refractive index $[n]_D$ = 0·145359 at 20°, corresponding with a molecular refraction of 45·06 (theory for one double bond = 45·65, for two 47·34). It oxidizes readily in the air. But whilst the menthene obtained from menthol is dextrorotatory with a maximum rotation of + 20°, this menthene, obtained from inactive menthyl chloride, is lævorotatory (in a thickness of 200 mm. $[\alpha]_D$ = — 56°), and the menthyl chloride which, as mentioned above, was not converted into menthene, is found to be no longer inactive, but is now lævorotatory (in a thickness of 200 mm. $[\alpha]_D$ = — 62°). The inactive menthyl chloride must thus have consisted of a mixture of dextro- and lævo-rotatory varieties, and the former was converted into lævorotatory menthene, while the latter was unattacked. By further heating with potassium acetate and acetic acid, it may, however, be converted into a dextrorotatory menthene boiling at 167–169°; in a thickness of 50 mm. $[\alpha]_D$ = +28°.

Menthone, $C_{10}H_{18}O$, was prepared by the action of chromic acid on menthol in acetic acid solution, and warmed with phosphoric anhydride. A diterpene, $C_{20}H_{32}$, was obtained, together with a hydrocarbon $C_{10}H_{18}$ which was not isolated. The diterpene is a very viscid, fluorescent, inactive liquid boiling at 320–325°; it takes up bromine and hydrochloric acid, and yields a yellowish, amorphous nitro-product when treated with fuming nitric acid. When menthone is added in successive small portions to a cooled mixture of

phosphoric chloride and light petroleum, a *monochloride*, $C_{10}H_{17}Cl$, and a *dichloride*, $C_{10}H_{18}Cl_2$, are obtained. The monochloride boils at 205–208°, has the sp. gr. at 0°/0° = 0·9833 and at 15°/15° = 0·970, is lævorotatory; in a thickness of 50 mm. $[\alpha]_D = +30°$, of 75 mm. $[\alpha]_D = +45°$. The dichloride boils at 150–155° under 60 mm. pressure, and has the sp. gr. at 0°/0° = 1·0824 The monochloride is doubtless formed from the dichloride by the loss of a molecule of hydrochloric acid, but it was not found possible to remove the second molecule from the monochloride. When bromine is added to a cooled acetic acid solution of menthene, *menthene dibromide*, $C_{10}H_{18}Br_2$, is formed. It is a rather viscid oil, boiling at 167–172° under 50 mm. pressure, and with the sp. gr. at 0°/0° = 1·4453. When it is heated with alcoholic potash for 15 hours on the water-bath, a hydrocarbon $C_{10}H_{16}$ is obtained. This boils at 172–174° (uncorr.), has an odor like that of limonene, and the sp. gr. at 0°/0° = 0·8540 and at 20°/20° = 0·8408; it unites with bromine and hydrochloric acid.

Terpine hydrate, $C_{10}H_{20}O_2 + H_2O$, was heated for 20 hours with strong hydriodic acid on the water-bath. The products were an *iodide*, $C_{10}H_{19}I$, a *diterpene*, $C_{20}H_{32}$, and possibly a hydrocarbon, $C_{10}H_{18}$, boiling at 167–170°. The diterpene boils at 320–325°, has the sp. gr. at 0°/0° = 0·9521 and at 20°/20° = 0·9428, and resembles very closely in its properties and reactions the diterpene obtained from menthone. The iodide is an oil with an odor like that of naphthene iodides; it boils at 138–142° under 30 mm. pressure, and has the sp. gr. at 15°/15° = 1·370. When it is treated with silver acetate, ether added, and the whole allowed to remain for two days, an acetate is obtained, and a hydrocarbon, $C_{10}H_{18}$, boiling at 168–170°. This latter has at 21° sp. gr. = 0·813 and refractive index $[n]_D = 1·45339$ corresponding to a molecular refraction of 45·89 (theory for one double bond 45·64). The acetate was hydrolyzed by warming it with the theoretical amount of alcoholic potash on the water-bath. The alcohol, $C_{10}H_{20}O$, thus obtained boils at 210–214°, and has an odor like that of menthol, but it cannot be got to solidify. It is inactive, and has the sp. gr. at 0°/0° = 0·9151 and at 15°/15° = 0·9063.

Menthol has thus been shown to be connected with the naphthenes; the particular naphthene obtained from it must have a ring of 6 carbon atoms, since menthol can be converted into cymene.

It is also connected with the terpenes, for terpine hydrate yields an alcohol, $C_{10}H_{20}O$, much resembling menthol; and, further, from menthol has been obtained a hydrocarbon, $C_{10}H_{16}$, which possesses the properties of a terpene.

SPURIOUS CUBEBS.

By E. M. Holmes, F.L.S.

Curator of the Museums of the Pharmaceutical Society of Great Britain.

A number of specimens for the Museum and Herbarium of this Society were received a few weeks ago from Mr. Leonard Wray, Jr. Curator of the Perak Museum, who is one of the recently elected corresponding members of the Pharmaceutical Society. When in correspondence with him some months since concerning cubebs and the ipoh or arrow poison of Perak, he promised to send specimens of the plants yielding them. He has now redeemed his promise by sending not only specimens of the desired plants but numerous others of considerable value and interest, together with information which seems to be of sufficient importance for publication.

Cubebs.—About seven years ago I directed attention to the fact that a variety of cubebs had appeared in English commerce which caused nausea and diarrhœa with other symptoms of poisonous action when taken internally (*Pharm. Journ.* [3], xv, p. 909). At the same time I pointed out that it did not give with sulphuric acid the crimson coloration characteristic of genuine cubebs, and that it possessed a mace-like odor. Further details as to color tests were subsequently published by Mr. E. D. Gravill (*l. c.*, p. 1005). A microscopical examination of this fruit was made at my request by Mr. W. Kirkby (*l. c.*, p. 653), who pointed out its distinctive histological characters, but added that it did not correspond to the *Piper crassipes* described by Flückiger and Hanbury in "Pharmacographia" (2d ed., p. 528), inasmuch as it had not a very bitter taste and had a shorter pedicel (*l. c.*, p. 654).

Subsequently Messrs. W. Elborne and H. Wilson expressed the opinion that the spurious variety "agrees entirely with that described by Flückiger and Hanbury and may be definitely referred to *Piper crassipes*" (*Pharm. Journ.* [3] xvi, p 517). Not being able myself to identify the false cubebs with that species or any other, either at Kew or at the British Museum Herbarium, and agreeing

in Mr. Kirkby's cautious conclusion, I wrote to Dr. M. Treub, of Java, for fruiting specimens of any variety of cubebs that he could send me, at the same time forwarding some of this spurious cubebs to him for comparison, and also other false cubebs. Dr. Treub kindly sent specimens of the fruit of *Cubeba officinalis*, both dried and preserved in spirit, and an herbarium specimen of the plant without flowers or fruit. He remarked in his letter:

"As to the origin of the false cubebs sent to me I am sorry to say that they are not known to me, except the keboe cubebs, which seem to be the fruit of *Cubeba mollissima*, Miq. *I believe the others are not from here.*"

The specimens sent by Dr. Treub were neither of them the false cubebs with the mace odor which I wished to identify botanically, and I then applied to Mr. H. N. Ridley, of Singapore, and Mr. L. Wray, of Perak, for information concerning it, thinking that if the alse variety was unknown to Dr. Treub it was probably exported from some other island or country to Singapore, which is the central emporium of the Eastern Indies.

In reply to my inquiries Mr. Wray sent me an herbarium specimen of a cubeb plant and some detached fruits, with the following remarks:

"I heard that some wild pepper was collected in the district of Selama, and on going there recently I found that it was 'Lada berekor,' or tailed pepper. I got a specimen of it and of the plant, and I think as it too has a macy odor, and turns brown when crushed with sulphuric acid, that it is the variety of cubeb that you want. I am sending you a sample, as also the leaves of the plant. Might I suggest that it be examined physiologically, as it may have properties which would render it of service as a drug.[1] The Perak Government agent in Penang, to whom I applied for information, writes as follows: 'Nothing is done here in cubebs. I am told that Singapore is the place, and I have written for samples. They say it is difficult to tell the difference between spurious and genuine.'"

Meanwhile my attention was directed by a Dutch friend to the

[1] Mr. Wray has sent sufficient for this purpose, and I shall be pleased to place two-thirds of the quantity sent at the disposal of any investigator. — E. M. H.

fact that merchants in Holland complain that cubebs which do not give the crimson color with sulphuric acid, but which were exported by the Java planters to Holland, do not find a ready sale. The hitherto unknown fact that false cubebs were cultivated in Java and exported to Holland (probably in ignorance of the fact that there is any difference between them) threw quite a new light upon the subject, and explained several points that required clearing up.

In the national herbaria in London there exist specimens of the cubeb plant (not in fruit) which differ considerably in the shape and size of the leaves, and the differences in the leaves appear to be constant in a series of specimens, indicating that probably more than one species is under cultivation. The information given by my Dutch friend led me to examine more carefully the specimens presented by Dr. Treub. On examination, in which my observations were checked by Mr. H. G. Greenish, it was found that the specimen preserved in spirit (which in size, shape, and length of pedicel resembles true cubebs), the fruits themselves did not give the crimson reaction characteristic of the genuine drug, but that on evaporation of the spirit in which they had been preserved, the residue gave the crimson color. On the other hand, the spike of dried fruit proved on examination to differ considerably from the specimen preserved in spirit. The fruits were larger and the stalks longer and somewhat flattened. The flavor, which is not mace-like, differed from that of true cubebs and the *taste was very bitter.* The fruits gave a yellowish brown but not a crimson reaction with concentrated sulphuric acid. The fruits are evidently not true cubebs, but those, in all probability, of the *Piper crassipes*, described by Hanbury and Flückiger in "Pharmacographia," and apparently the same as the large blackish cubebs imported into this country some months since. The absolute identity of these I shall endeavor to ascertain by histological examination. So far as observation by a lens and by taste are concerned, *Piper crassipes*, Korth., is the source of the dried cubebs sent by Dr. Treub and of the cubebs lately imported into England, but *not of the cubebs with a mace-like odor.*

The latter variety of cubebs yet remains to be identified, but as the plant yielding it is now traced to the plantations in Java further information will probably soon be forthcoming. In a volume of five hundred pages just received from Dr. Treub, and containing a history of the Buitenzorg Gardens and a large amount of informa-

tion concerning the plants grown in it, I find on p. 417, that the Soendanese distinguish three varieties of cubebs, viz: "Rinoe tjaroeloek," "Rinoe katjentjan," and "Rinoe badak," *which are all present in plantations.* It further appears, from statements on the same page, that the plant cultivated as cubebs in the Java Botanic Gardens up to 1886 was not the true plant, and that the genuine species was subsequently procured and on being planted out produced flowers and fruit. The occurrence of two species in the specimens kindly presented by Dr. Treub is probably thus explained.

The specimen of cubebs which was presented by Mr. L. Wray does not, so far as I can discover, possess any mace-like odor; but, as he says, it gives a brownish color with sulphuric acid. By means of the herbarium specimen he has kindly sent, I have been able to identify the plant as *Piper ribesioides*, Wall. It agrees perfectly with specimens of this plant in the Natural History Museum at South Kensington and at Kew.

Our present knowledge of cubebs and the substitutes for it met with in commerce may be summarized as follows:

The cubeb plants cultivated in Java are of three kinds. These are in all probability *Piper Cubeba, L.f.*, *Piper crassipes*, Korth., and a third variety, with fruits having a macy odor.

Piper crassipes may be distinguished by its larger size, long, slender, flattened stalk, and its bitter taste. It does not give a crimson color with sulphuric acid.

The cubeb with a macy odor resembles the true cubeb in shape and size, but is grayer, more wrinkled, and does not give a crimson color with concentrated sulphuric acid.

The fruits of *Piper Lowong*, Bl. (*Cubeba Lewong*, Miq.) are stated by Flückiger and Hanbury to be extremely cubeb-like ("Pharmacographia," 2d ed., p. 58); and as this species is a native of Java, it is quite possible that it may yield the cubebs with a macy odor. I have not, however, been able to find in either of our national herbaria a specimen of this species in mature fruit.

The fruit of *Piper ribesioides* is collected in the Selama district of Perak in small quantity, but there is no evidence that it enters into English commerce.

In the report of the Buitenzorg Botanic Gardens above quoted, it is stated that the cubeb plant is more easily propagated by layers

than by slips.[1] In making the layers the stems are laid on the ground and covered with only a little earth. From these prostrate stems numerous erect shoots arise. It is found that quick growing trees must not be used as supports, as these are apt to break the cubeb stems by their rapid growth. When raised from seed the young plants are germinated in pots in the shade or under glass, but when the leafy stems are developed they are planted out in the full light, although the plant is a native of the bushy woods. The cubeb plant does not afford a large yield of fruit.—Pharm. Jour. and Trans., Aug., 1892.

MEETINGS OF STATE PHARMACEUTICAL ASSOCIATIONS.

The Arkansas Association of Pharmacists convened at its tenth annual meeting at Fort Smith, June 21, President Shendal in the chair, and listened to an address from the president and to the reports of officers and committees. The subjects of the papers read were: Process for tincture of opium, by J. A. Ginochio; English and American calomel, by J. M. Anderson; Pharmaceutical notes, by W. W. Kerr, and J. W. Beidelman; and identification of the ordinary drugs and chemicals, by E. T. Mitchell. J. W. Morton, Fort Smith, was elected president; J. W. Beidelman, Little Rock, secretary; and J. A. Jungkind, Little Rock, Treasurer. The next meeting will convene at Little Rock, the date to be announced hereafter.

The Colorado State Pharmacal Association assembled at its third annual meeting at Denver, August 4, and was welcomed by Mayor Rogers. President Ford read an address; the various officers and committees presented their reports, and papers were read on adulterations and sophistications by Nich. Anderson; on antiseptics, germicides, disinfectants and deodorizers, by C. D. Lippincott, and on the chemical resources of Colorado. H. M. Whelpley, C. S. Hallberg, J. P. Remington and J. M. Maisch were elected honorary members. J. W. Turrell, Longmont, was elected president; J. F Feezer, Greeley, treasurer, and Felix A. Lyneman, Denver, secretary. The next place of meeting, date, and local secretary will be named by the executive committee.

The Iowa Pharmaceutical Association met in Davenport at its thirteenth annual meeting, June 14. The usual routine business, the president's address, reports of officers and committees, examination of the work done by students in pharmacy, and discussions on practical pharmaceutical matters, claimed the attention of the meeting. The officers elected are: T. W. Ruete, Dubuque, president; Dr. Rosa Upson, Marshalltown, secretary; and J. H. Webb, De

[1] This is perhaps more easily understood when it is stated that the cubeb is a climbing plant attaching itself to its support by roots which are formed near each leaf base, and one side of the stem, as in ivy.—E. M. H.

Witt, treasurer. The association intends holding its meeting in 1893 in Chicago.

The Michigan State Pharmaceutical Association held its tenth annual meeting at Grand Rapids, August 2, President Coleman in the chair. A number of papers were read, mostly giving the results of work done in the School of Pharmacy, University of Michigan. Various legislative measures were discussed, and the discussion of the cut-rate problem led to the recommendation that the sale of proprietary articles handled by cutters be discouraged, and that in their place medicines of similar properties, manufactured by or for pharmacists, be offered to the public. Stanley E. Parkill, Owosso, was elected president; C. W. Parsons, Detroit, secretary, and W. H. Dupont, Detroit, treasurer. It has been proposed to meet next year near Detroit and then adjourn to Chicago.

The Minnesota Pharmaceutical Association opened its eighth annual meeting at Duluth, July 13, and adjourned on the following day, transacting mostly routine business, and discussing legislative measures and trade interests. A paper on commercial glycerin from animal and vegetable fats was read by L. A. Harding. The officers for the present year are: C. R. J. Kellam, Heron Lake, president, and C. T. Heller, St. Paul, secretary and treasurer. The time and place of the next annual meeting will be decided upon by a committee appointed for the purpose.

The Missouri Pharmaceutical Association had its fourteenth annual meeting June 14, at Excelsior Springs, where it has met for several years in succession. In addition to the president's address and to the reports of officers and committees, several papers were read by Dr. Curtman, G. H. C. Klie and others. The present officers are: G. H. C. Klie, president; Dr. Whelpley, secretary, and G. J. Meyer, treasurer. The next meeting will again be held in the same place June 13, 1893.

The Montana State Pharmaceutical Association, at its second annual meeting, held at Butte, elected H. M. Parchen, Helena, president; W. M. McGinnes, White Sulphur Springs, treasurer, and J. B. Lockwood, Helena, secretary.

The New York State Pharmaceutical Association met at its fourteenth annual meeting at Syracuse, May 24. The address of President Ingraham; the various official reports, and certain trade interests afforded subjects for discussion. During the past year a bill, originating with the Woman's Christian Temperance Union, had been before the New York Legislature prohibiting the sale of preparations of opium, cocaine and chloral, except upon physicians' prescriptions. A committee appointed to consult with the W. C. T. Union reported that the latter body had promised not to press the passage of the bill until after the next session of the legislature so as to afford to druggists and apothecaries the opportunity of discussing it thoroughly. W. L. DuBois, Catskill, was elected president; C. W. Holmes, Elmira, Secretary, W. B. Fuller, Oswego, treasurer, and F. E. Hatch, Jamestown, local secretary for the next meeting to be held at Lakewood, Chautauqua Lake, in June, 1893.

The North Carolina Pharmaceutical Association held its thirteenth annual meeting at Raleigh, August 10, when the reports of officers and committees were presented, and various matters of pharmaceutical interest were discussed.

Professor Caspari, of Baltimore, read a paper on the assay of alkaloidal drugs and galenical preparations, and illustrated the processes by experiments. He was elected an honorary member. The officers for the present year are: H. R. Chears, Plymouth, president; A. J. Cook, Fayetteville, treasurer; F. W. Hancock, Oxford, secretary; and F. A. Bobbitt, Winston, local secretary. Next year the Association will meet at Winston, August 16.

The Wisconsin Pharmaceutical Association was convened August 8, at Oshkosh, in the thirteenth annual meeting, and finally adjourned to meet in August next year at Fond du Lac, Jas. T. Dana being the local secretary. Henry Rollman, Chilton, was elected president; W. P. Clark, Milton, treasurer, and E. B. Heimstreet, Janesville, secretary.

Proceedings of State Pharmaceutical Associations for 1892 have been received as follows:

Alabama. Eleventh meeting. Pp. 71. (See July number, p. 382.)

Georgia. Seventeenth meeting. Pp. 120. (See July number, p. 383.)

New York. Fourteenth meeting. Pp. 268. (See above.)

EDITORIAL.

The Flückiger Memorial, to which attention was called on p. 172 of this volume, is now an accomplished fact. Professor Dr. Tschirch, under date of July 1, reported the total amount collected to be francs 12722.09, exclusive of frcs. 7127.45, sent by several American gentlemen as a personal present to Professor Flückiger. In accordance with the plan originally published, an address was presented to him, July 9, bearing the signatures of all the contributors, viz: 27 societies and 702 individuals. A medal struck in gold, silver and bronze, bears on one side the relief portrait of Professor Flückiger, and the reverse side the inscription: *Scientia non unius populi sed orbis terrarum.* For 307 photographs sent an album was specially made and artistically embellished; and a supplementary album was procured for the photographs subsequently received. After deducting the expenses for the above there remained the sum of francs 10,000, available for a foundation, and provisionally deposited in a bank in Bern, Switzerland, the present place of residence of Prof. Flückiger.

Professor Edward Schaer, for a number of years Professor of Pharmacy, and director of the pharmaceutical department of the Polytechnikum at Zurich, we learn from German journals, has been appointed Flückiger's successor at the University of Strassburg.

Professor Emil Fischer, of the University of Würzburg, has been called to the University of Berlin as the successor of A. W. Hofmann, deceased in May last; and the vacancy made at the former institution was filled by calling Professor Th. Curtius, of the University of Kiel, to the chair of chemistry.

The Pharmaceutical Examining Board of Pennsylvania, at its meeting in Williamsport, July 12, examined 47 candidates for registered pharmacists and 27 for qualified assistants. Twenty of the former and fourteen of the latter were successful.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Feestnummer der Berichten van de Nederlandsche Maatschappij ter Bevordering der Pharmacie. Uitgegeven ter gelegenheid der feestelijke Herdenking van haar vijftig-jarig Bestaan. 's Gravenhage: De Gebroeders Van Cleef. Juli, 1892. 4°. Pp. 189.

The Society for the Furtherance of Pharmacy in Netherland was organized in 1842, and in July last it celebrated the fiftieth anniversary of its existence. The volume before us has been published in commemoration of this event. It does not contain a full account of the transactions on that occasion, but only the address then delivered by the presiding officer of the Society, Dr. P. Ankersmit. Nearly the whole of the book is taken up by scientific and practical essays and researches written especially for this festive occasion. The pharmaceutical laboratory of the University of Utrecht contributes six papers. The remaining twenty-five contributions have as authors as many members of the Society. The subjects treated of belong to different fields of pharmacy, all of practical application. Among the authors, who are probably best known on this side of the Atlantic, may be mentioned L. van Itallie, Prof. Oudemans, Prof. Stoeder, Dr. De Vrij.

Popular German Names of Domestic Drugs and Medicines.—Volksthümliche Deutsche Arzneimittel-Namen. Bearbeitet von Dr. Fr. Hoffmann. Revidirte und vermehrte Auflage. New York: 1892. Office of Pharmaceutische Rundschau. 8vo. Pp. 36. Price, 40 cents; or 75 cents for two, and $1 for three copies.

With commendable care the author has collected not only those German names for drugs and medicinal preparations which are usually met with in printed works, but likewise those which are popularly employed in different districts of Germany. A dictionary containing considerably over three thousand names has thus been made up, for each of which the Latin equivalent is given. Its practical value and usefulness to pharmacists having dealings with German-speaking customers is quite evident. For the rarer preparations there is also a list of references given, indicating where formulas for the same may be found, and it will be seen that quite a number of these are contained in the National Formulary.

A Manual of Organic Materia Medica, being a guide to Materia Medica of the Vegetable and Animal Kingdoms, for the use of Students, Druggists, Pharmacists and Physicians. By John M. Maisch, Ph. M., Phar. D., etc. Fifth edition. With 270 illustrations. Philadelphia: Lea Brothers & Co. 1892. 12mo. Pp. 556.

The fifth edition of this work has passed through the press and will be issued in a few days. In the preface we are informed that it differs from the preceding edition mainly in this that the recent observations and researches on the various articles of Materia Medica, as far as they come within the scope of the work, have been incorporated, and that the pronunciation of the systematic names of plants and animals has been indicated by marks of accent. The text has also been carefully revised with the view of rendering the characterization of the drugs and of their constituents even more precise and available for critical research. A number of new illustrations, partly replacing

others, have been prepared in elucidation of structural descriptions, and the pharmacopœial drugs have been more conspicuously distinguished by the selection of smaller type for those articles which are not recognized by the Pharmacopœia, or which at present are scarcely ever met with in commerce. Of the same importance as pharmacopœial crude drugs appear to be such, which—like Juniperus virginiana, Rhamnus Purshiana, etc.—bear a close resemblance to officinal ones, or which—like Sabadilla, Cocculus indicus, etc. —are the sources of proximate principles, admitted into the Pharmacopœia as important remedies. In indicating the pronunciation the U. S. Pharmacopœia has been closely followed; but in several cases where different pronunciations appear to be sanctioned by good authorities, the two forms are given side by side.

The Extra Pharmacopœia. By Wm. Martindale, F.C.S., etc. Medical References and a Therapeutic Index of Diseases and Symptoms, by W. Wynn Westcott, M. B. Lond., etc. Seventh edition. London: H. K. Lewis. 1892. Pp. 524.

On the appearance of previous editions of this useful work we have explained its scope and arrangement. As it deals primarily with non-pharmacopœial articles, it is a very acceptable supplement to the Pharmacopœia. The present edition has been brought up to date by the incorporation of new facts given in recent pharmaceutical literature, and of new claimants for honors as remedial agents, such as analgene, camphoid, euphorin, iodopyrin, phenocoll, salicylamide, salophene, etc. That many of these new remedies reach only an ephemeral reputation is well known; but they have to be carried in works of reference as ballast for some time; and the prospects are that their number will continue to increase, as long as manufacturers will find it remunerative to bring upon the market new inventions heralded as important remedies before they have been sufficiently tested by unbiased investigators.

Experimental Farms. Reports for 1891. Printed by order of Parliament. Ottawa. 1892. 8vo. Pp. 348. Price, cloth, 25 cents.

These reports to the Minister of Agriculture of the Dominion of Canada have been prepared by the Director of Experimental Farms, Wm. Saunders, and under his supervision.

Book on the Physician Himself, and Things that Concern his Reputation and Success. By D. W. Cathell, M.D. Tenth Edition. Carefully revised and greatly enlarged. Philadelphia: The F. A. Davis Company, Publishers. 1892. 8vo. Pp. 343. Price, $2 net.

That this book has met with so much favor must be quite gratifying to the author. On a former occasion (this journal, October, 1889, p. 541) we commented on it somewhat in detail, and now that it is before us in a new garb, we need merely say that the care bestowed upon it in revising the text has not in the least detracted from its merits, but, if such be possible, has improved it. It is a work that deserves to be read, and that should be read with profit to the reader, as we pointed out before. How to do this the author tells us in the preface. "I beg you," he advises, "to judge it, good reader, not by opening it here or there, nor by glancing at detached paragraphs; but read it through, from cover to cover, or better still, *study its pages*, and thus qualify yourself to weigh correctly its teachings, which I would fain have to harmonize with the

advice given by the Bishop of Lonsdale to those who came to him inquiring the way to heaven: 'Turn to the right, then go straight forward.'"

Ueber die Isomeration höherer Homologen des Aethylens und Acetylens. Von L. Reuter. Heidelberg. 1892. 8vo. Pp. 29.

On the isomeration of the higher homologues of ethylene and acetylene. This inaugural essay is dedicated to Prof. Flückiger.

Planten en Plantenstoffen. Door M. Greshoff. Batavia. 1891. Pp. 28.

This is a discourse on plants and plant constituents, delivered by Dr. Greshoff, at Batavia, before the Society for Natural History in Dutch India, and which treats of the importance of phyto-chemistry in the broader sense of the term.

The reception of the following theses from the École supérieure de Pharmacie de Paris is herewith acknowledged:

Recherches sur quelques Corps Gras d'origine végétal. Par Ernest Gérard. Pp. 74.

Researches on some fats of vegetable origin, viz: of stramonium seed, oats, and of two fungi, Lactarius vellereus and L. piperatus.

Recherches nouvelles sur les Vins. Par Louis Joseph Hugounenq. Pp. 32.

New researches on wines containing among others processes for the estimation of tannin and for the extraction and examination of coloring matters in wine.

Étude sur la neutralisation des Acides et des Bases par la méthod des conductibilités électriques. Par Paul Alfred Daniel Berthelot. Pp. 45.

Study upon the neutralization of acids and bases by the method of electric conductibilities.

Contribution à l'Étude histologique des Lauracées. Par E. Perrot. Pp. 62.

Contribution to the histological study of lauraceæ; the structure of stems and leaves has been more particularly studied.

Sur un nouveau Corps gazeux, le Pentafluochlorure de Phosphore. Par Camille Poulenc. Pp. 23.

On a new gaseous body, pentafluochloride of phosphorus, prepared by acting with chlorine upon trifluoride of phosphorus; the composition of the gas is PF_3Cl_2.

Contribution à l'Étude chimique du Chloroforme; action des Sulfures de Potassium et de Sodium. Par Louis Demont. Pp. 64.

Contribution to the chemical study of chloroform; action of the sulphides of potassium and of sodium.

Detail Illustrations of Yucca and Description of Agave Engelmanni. By Wm. Trelease. 8vo. Pp. 10, and 25 plates.

The Yucca Moth and Yucca Polination. By Chas. V. Riley. 8vo. Pp. 60, and 10 plates.

The Fruiting of Parmelia molliuscula. By Thos. A. Williams. 8vo. Pp. 2, and 1 plate.

These three monographs are reprints from the third annual report of the Missouri Botanical Garden. The subject matter of each is readily ascertained from the title, but special attention may be called to the fact that the first one

gives also the botanical description of a new species of agave, the origin o. which has not yet been determined; and that the last one gives an account of the apothecia of a lichen, which, though frequently collected in different parts of the globe, has always been regarded as being sterile.

On Citronellone, an unsaturated fatty aldehyde. By Edward Kremers.

Menthene. By F. A. Sieker and E. Kremers.

Two reprints from Amer. Chemical Journal, xiv, Nos. 3 and 4.

The Limonene Group of Terpenes. By Edward Kremers.

This essay, covering 51 pages, was read before the Wisconsin Academy of Sciences, Arts and Letters, December 30th, last, and is reprinted from volume viii of its Transactions.

OBITUARY.

Professor Valerian Ossipowitch Podwissotzky died at Kasan, Russia, June 28, aged seventy years. He was born in 1822 and studied law, passing his examinations in 1842, after which he was called to various state and municipal offices. At the age of fifty, he matriculated at the University of Dorpat as a medical student, and graduated as doctor of medicine in 1878, his inaugural dissertation being "anatomical researches of the tongue glands of man and mammals." While in Dorpat he investigated emetine and the constituents of ergot, of Lippia mexicana and of resin of podophyllum, researches which gained for him a world-wide reputation. In 1885, he was appointed professor of pharmacognosy and of pharmacy to the University of Kasan where, in 1886 he published a manual of pharmacognosy in the Russian language. The deceased was a corresponding member of the Philadelphia College of Pharmacy.

The following graduates of the Philadelphia College of Pharmacy are deceased:

James S. Bell, class 1869, died in Peoria, Ill., May 25, 1892, from disease of the kidneys. He was born and educated at Bolton, Peel Co., Ontario, and after serving an apprenticeship at Albion, came to Philadelphia, and clerked with the late Professor Edward Parrish. After graduating, he went to Peoria, and started in business in 1874, the title of the firm being Bell & Miller until 1877, since which time he carried on the business until his death. He leaves a widow and one daughter, and is survived by his father and a sister.

William E. Knight, class 1838, died in Philadelphia, June 9, of uræmia, at the age of 73 years. He was a native of England, and came to this country with his parents when 5 years of age. For some years he had been clerking for Francis Bond, at the corner of Tenth and Locust Streets, and succeeded to the business more than forty years ago. For years he had been one of the "characters" of the city, his bent form and smiling face and his dusty little store, which was somewhat of an old curiosity shop, being well known to the residents of his neighborhood, particularly to the poor and destitute whom he freely befriended, and of whom many attended the funeral services. Although he gave away money and medicines with a free hand, Mr. Knight was successful in business and died rich. He was never married.